

# Electricity & Magnetism

## 1. Question & Research Task

What do doorbells, microwaves, and speakers all have in common? They all use **Electricity** and **Magnetism**. You experience Electricity and Magnetism in many areas of life, even if you don't see it. **Electricity** and **Magnetism** are found in many fields: entertainment, construction, and medical.

It is important to understand the basics of **electricity** and **magnetism** in order to apply the concepts to real-world experiences. Review the following resources to strengthen your background knowledge on the basics of **electricity** and **magnetism**.

- [Electromagnetism](#)
- [Magnetism](#)
- [Electricity and Magnetism Vocabulary](#)

In this Slam Dunk, you will conduct brief, focused research to respond to the inquiry question:

How do the concepts of electricity and magnetism impact diagnoses and treatments in the medical field?



Images Source: unsplash.com

## 2. Information Sources

**Electricity** and **Magnetism** are used extensively in the medical field. [Medical Imaging](#) is commonly used in the [diagnoses](#) of patients. **Electricity** and **Magnetism** are also commonly present in medical devices used to treat patients. View the sources below in order to:

- Discover the function of the device
- Gain a better understanding of the use of electricity and magnetism in the medical field

Digital resources:

- [MRI Scans](#)
- [Electrocardiogram \(ECG/EKG\)](#)
- [What is a Pacemaker?](#)

You will be asked to **select one type** of medical device in order to research in detail.

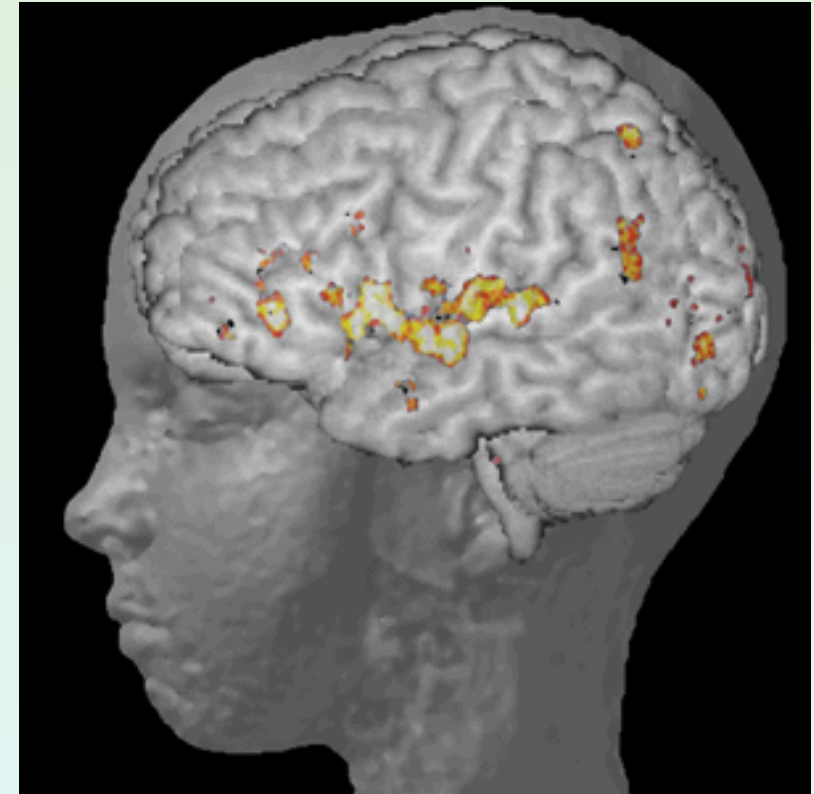


Image Source: [World Book Advanced](#) by subscription

### 3. Student Activity

**With a partner or small group choose one type of medical device:**

- MRI
- ECG/EKG
- Pacemaker

Use the digital resources provided on the previous page in order to research. Gather your research on the [graphic organizer](#). Focus your thoughts and information on the following questions:

- How does the medical device use electricity or magnetism?
- How does the medical device help to prevent or treat a patient?
- What side-effects or concerns are associated with the medical device in connection to electricity or magnetism?



Image Source: wikimedia



## 4. Assessment Activity

How do the concepts of electricity and magnetism impact diagnoses and treatments in the medical field?

Using the information gathered, [create a script for a commercial](#) providing the public the following information about your chosen medical device:

- **How the medical device uses electricity or magnetism?**
- **How the medical device helps to prevent a problem or treat a patient?**
- **Any side-effects or concerns that are associated with the medical device.**

Your teacher may choose to use [this rubric](#) to assess your commercial script.

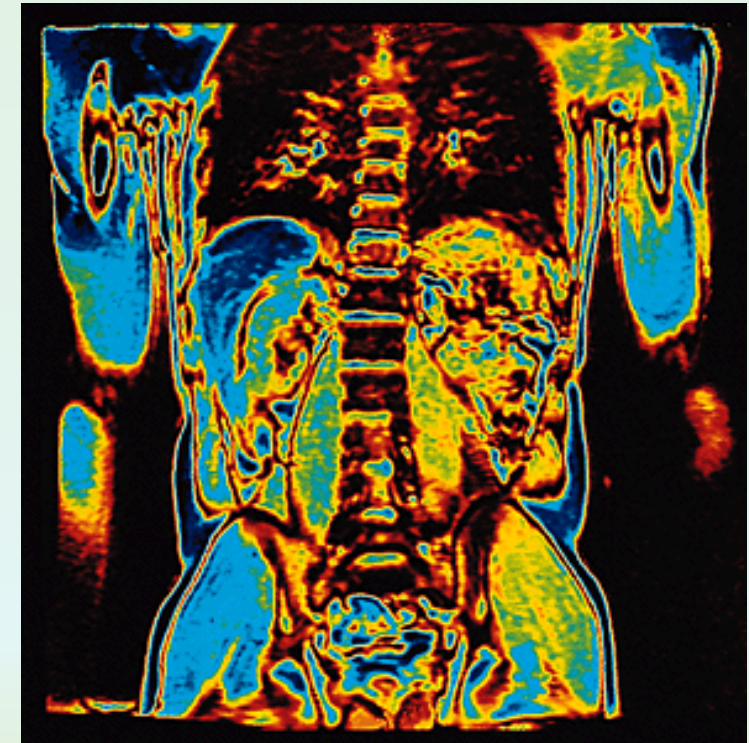


Image Source: [World Book Advanced](#) by subscription

## 5. Enrichment Activities



Image Source: unsplash

There is some **controversy** in the medical field about using devices such as: MRI, EKG, and pacemakers due to the potential **side-effects** and negative impacts on the body. View the following sites to learn more about the safety of the devices.

- [Pacemaker Implantation Risks](#)
- [Side Effects of MRI with Contrast](#)
- [Electrocardiogram](#) - Mayo Clinic
- Choose one of the medical devices listed above and compose an argument advocating for or against the device or test.

Possible Career Connections:

- [MRI Technician](#)
- [EKG Technician](#)

# 6. Teacher Resources

## Learning Standards Alignment

### Content Learning Standards

#### [Next Generation Science Standards](#)

HS-PS4-5. Communicate technical information about how some technological devices use the principles of wave behavior and wave interactions with matter to transmit and capture information and energy.

#### [MCCR ELA Standards for Grades 9-12](#)

**Reading: 1.** Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

**Writing: 7.** Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

[AASL Standards Framework for Learners](#) Inquire: Build new knowledge by inquiring, thinking critically, identifying problems, and developing strategies for solving problems.

Think: Learners display curiosity and initiative by:

I.A.2 Recalling prior and background knowledge as context for new meaning.

Create: Learners engage with new knowledge by following a process that includes:

I.B.1 Using evidence to investigate questions. I.B.3 Generating products that illustrate learning.

Share: Learners adapt, communicate, and exchange learning products with others in a cycle that includes:

I.C.1 Interacting with content presented by others.

Grow: Learners participate in an ongoing inquiry-based process by:

I.D.2 Engaging in sustained inquiry.

#### [P21 Framework: 21<sup>st</sup> Century Student Outcomes](#)

**3. Information, Media & Technology Skills: Information Literacy:** Access information efficiently and effectively; Use information accurately and creatively for the issue or problem at hand.

**ICT Literacy:** Use technology as a tool to research, organize, evaluate and communicate information.

### SLIDE NAVIGATION

<a href="#">1</a>	<a href="#">2</a>	<a href="#">3</a>	<a href="#">4</a>	<a href="#">5</a>	<a href="#">6</a>
-------------------	-------------------	-------------------	-------------------	-------------------	-------------------

## Grade 9-12 Content Area: Science Unit: Electricity and Magnetism

**Time Frame:** One 90-minute class periods

### Notes to the teacher:

- Collaborate with your school library media specialist to plan and implement this lesson.
- Provide students with login information as needed to authenticate BCPS Digital Content. Login information is on the **BCPS Digital Content** page in the [Apps Portal](#).
- Consider using the [Schoolology Assignment App](#) feature to assign Google Docs for students to access, edit, and submit through Schoolology.